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Article

The Institutional Importance of Agricultural Census in Ensuring Agrarian Economic Growth: The Experience of Uzbekistan

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Abstract: This article scientifically examines the role of the agricultural census in ensuring agrarian economic growth. The study evaluates the economic significance of the census based on regulatory and legal documents, statistical data, and forecast indicators in the agricultural sector. The results show that the database formed through the agricultural census plays a crucial role in the efficient use of resources, assessment of the sector's condition, development of agrarian policy, and formulation of economic growth forecasts. In addition, the outcomes of the census serve as an important source of information for ensuring food security and promoting the development of digital agriculture. Furthermore, the study substantiates that the effectiveness of the agricultural census depends on the quality of data and the level of its integration into the management system. Overall, the agricultural census is evaluated as an important instrument for ensuring sustainable growth in the agrarian economy.

Keywords: Agriculture, agricultural census, agrarian economy, economic growth, food security, statistical data, resource efficiency, digital agriculture, forecasting, agrarian policy.

Introduction

In the context of global climate change, water scarcity, and population growth, the issue of sustainable development of the agricultural sector is becoming increasingly relevant worldwide. In particular, ensuring food security, efficient use of resources, and increasing the productivity of agricultural production are among the top priorities of state policy today [1].

In Uzbekistan, significant structural reforms have been implemented in the agricultural sector in recent years. However, the effectiveness of these reforms largely depends on the availability of accurate, reliable, and systematized statistical data [2]. From this perspective, the agricultural census is emerging as an important instrument for effective management of the agrarian economy [3].

It is important to emphasize that, in the Republic of Uzbekistan, the population and agricultural census is being conducted in a comprehensive manner for the first time [4]. This creates a foundation for elevating the national statistical system to a new level,

forming a reliable database in the agricultural sector, and strengthening the scientific basis of public administration.

This process is organized in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 629, dated October 7, 2025, "On Measures for Conducting the Population and Agricultural Census in the Republic of Uzbekistan," which defines the main organizational and legal mechanisms for preparing and conducting the census [5].

In particular, the resolution outlines the following priority tasks:

- formation of a complete and reliable database on agriculture and population;
- introduction of a census information system and effective use of digital technologies;
- development of questionnaire forms and unified methodological approaches;
- ensuring information security and data quality during the census process;
- conducting analysis based on collected data, developing forecasts, and designing state programs.

At the same time, the agricultural census enables the formation of comprehensive data on the actual state of the sector, resource allocation, production volumes, and the level of infrastructure development. These data provide opportunities to scientifically substantiate agrarian policy, identify regional "growth points," redistribute resources, and develop short-, medium-, and long-term forecasts.

Moreover, the growing demand for large volumes of reliable data in the implementation of modern digital technologies-such as artificial intelligence, geographic information systems, and electronic platforms-further increases the importance of the agricultural census.

The purpose of this study is to scientifically substantiate the role of the agricultural census in ensuring agrarian economic growth, as well as to analyze its interrelationship with public policy and practical outcomes.

Methodology

In this study, a comprehensive and systematic approach was applied to assess the role of the agricultural census in ensuring agrarian economic growth. The research methodology is based on a set of interrelated scientific methods.

First, the method of regulatory and legal analysis was used to examine the content of decrees of the President of the Republic of Uzbekistan related to the agricultural census, as well as relevant resolutions of the Cabinet of Ministers [6]. This method made it possible to identify the legal and organizational foundations of the census, as well as its objectives and tasks.

In addition, statistical analysis was employed to examine key indicators in the agricultural sector, including production volumes, growth rates by subsectors, resource allocation, and forecast data by types of agricultural products [7]. In particular, projected agrarian growth indicators and production volumes for 2026 were analyzed, and the sources of their formation were assessed.

The study also utilized a comparative analysis method to conceptually examine differences in the effectiveness of agrarian management under conditions with and without an agricultural census. This approach helped to more deeply reveal the economic significance of the census [8].

Furthermore, based on system analysis, a "data–analysis–decision–outcome" chain was developed, and the role of the agricultural census in the agrarian economy was substantiated through this framework [9]. This approach allowed the entire process—from data collection in agriculture to decision-making based on these data and the achievement of final outcomes—to be considered as an integrated system.

The research also applied induction and deduction methods. Through the inductive approach, general conclusions were derived from specific indicators and empirical data, while the deductive approach was used to explain practical processes in the agricultural sector based on general theoretical principles.

Finally, the analysis–synthesis method was applied to generalize data obtained from various sources and to formulate unified scientific conclusions [10].

Overall, this set of methodological approaches made it possible to comprehensively and scientifically assess the impact of the agricultural census on agrarian economic growth.

Results

The findings of the study scientifically substantiate that the agricultural census serves as a fundamental information base for ensuring agrarian economic growth. The analysis of the collected data revealed that the economic and institutional effectiveness of the census is manifested across the following priority areas:

1. Mechanism for Comprehensive Assessment of the Sector's Actual Condition

The database formed as a result of the agricultural census enables an accurate assessment of the structural composition of agriculture. This process can be expressed through the following integral indicator:

$$AI = \sum_{i=1}^{n} w_i \cdot X_i$$

where:

AI — Agrarian Information Index;

$\mathbf{X_i}$ — indicators such as land area, yield, livestock numbers, and resource utilization;

$\mathbf{w_i}$ — weight coefficients reflecting their significance.

This index allows for the evaluation of the actual condition of the sector and the efficiency of resource utilization.

2. Empirical Basis for Macroeconomic Forecasting

Based on census data, economic growth forecasts for 2026–2028 were scientifically substantiated. The dynamics of GDP growth were assessed using the following formula:

$$GDP_{growth} = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \times 100\%$$

According to the analysis:

- GDP volume: **1976 → 2576 trillion UZS**
- Growth rate: **6.6% → 6.9%**

In addition, the sectoral growth index was evaluated as:

$$SI = \frac{Q_t}{Q_{t-1}}$$

where:

SI — sectoral growth index;

$\mathbf{Q_t}$ — production volume in the current year.

These indicators demonstrate that census data significantly improve the accuracy of forecasting.

3. Identification of "Growth Points" and Regional Efficiency

Based on census data, the following coefficient was proposed to assess regional economic efficiency:

$$RE = \frac{Y}{R}$$

where:

RE — resource efficiency;
Y — gross output;
R — resources used (land, water, labor).

This approach makes it possible to determine regional specialization and investment attractiveness.

4. System of Food Security Indicators

The study developed a system of indicators to assess food security:

$$FS = \frac{P}{C}$$

where:

FS — food security coefficient;
P — domestic production;
C — consumption volume.

If **FS ≥ 1**, food self-sufficiency is considered achieved.

Additional indicators include:

- **Import dependency coefficient:**

$$ID = \frac{Import}{Consumption}$$

- **Price stability index:**

$$PSI = \frac{P_t}{P_{t-1}}$$

5. Digital Technologies and Data Quality Index

The agricultural census, as a foundation for digital transformation, was evaluated using the following index:

$$DQI = \frac{A + T + C}{3}$$

where:

DQI — Data Quality Index;
A — accuracy;
T — timeliness;
C — completeness.

This index enables the assessment of the effectiveness of implementing GIS, artificial intelligence, and monitoring systems.

6. Institutional Efficiency and Decision-Making Model

The results of the census influence economic efficiency through the following chain:

$$E = f(D \rightarrow A \rightarrow P \rightarrow R)$$

where:

D — Data;

A — Analysis;

P — Policy;

R — Result.

This model reflects the role of the agricultural census in strategic decision-making.

The research findings indicate that the agricultural census:

- forms a data-driven model of the agrarian economy;
- improves the accuracy of forecasting;
- ensures efficient use of resources;
- strengthens food security;
- accelerates the transition to digital governance.

As a result, the agricultural census emerges as a fundamental and decisive element of the "data–analysis–decision–outcome" chain.

Discussion

The results of this study confirm that an agricultural census serves as an important institutional mechanism for ensuring agrarian economic growth. However, the effectiveness of this process is not limited to data collection alone; it also directly depends on the quality of the data, their processing, and the degree to which they are integrated into decision-making processes [11].

First, as identified in the study, the data generated through the census play a crucial role in providing a scientific basis for agrarian policy. This finding is consistent with international practice. Global experience shows that agricultural census data constitute a primary source of information for shaping food security strategies, subsidy policies, and resource allocation mechanisms in different countries [12]. From this perspective, the introduction of such a system in Uzbekistan contributes to aligning agrarian governance with global standards.

However, from a critical standpoint, several institutional and methodological challenges may hinder the effective use of census results. In particular, the reliability and completeness of data remain pressing issues. The submission of incomplete or inaccurate information by households and farming entities can negatively affect the accuracy of analytical outcomes. This, in turn, increases the risk of making incorrect economic decisions [13].

Second, the degree to which census results are integrated into the governance system is also a critical factor. If the collected data are not effectively utilized in practice, their strategic importance diminishes. Therefore, integrating databases with digital platforms, enabling real-time analysis, and embedding them into decision-making processes are of paramount importance [14].

Third, the implementation of digital technologies highlighted in the study (such as artificial intelligence, geographic information systems, and drones) expands the possibilities for the effective use of census data. However, this process requires the availability of high-quality data, adequate technical infrastructure, and skilled personnel. If these conditions are not sufficiently ensured, the digitalization process may fail to deliver the expected outcomes [15].

At the same time, the study findings demonstrate that agricultural census data serve as an important tool for identifying "growth points" at the regional level. This facilitates targeted investment allocation and more efficient use of resources [11], [12]. Nevertheless, it should be taken into account that the effectiveness of decisions based on regional data also depends on the institutional capacity of local governance bodies.

Furthermore, although census data are of strategic importance for ensuring food security, they must be harmonized with market mechanisms. In other words, if a balance between production forecasts and actual market demand is not achieved, issues such as overproduction or product shortages may arise [13].

Overall, the findings indicate that while an agricultural census is a necessary condition for ensuring agrarian economic growth, it is not sufficient on its own. Its effectiveness is determined by the quality of data, the institutional environment, the level of digital infrastructure, and the scientific validity of the decisions made [14], [15].

Conclusion

The findings of this study confirm that an agricultural census holds strategic importance in the effective management of the agrarian economy. A reliable and accurate database generated through the census serves as a key factor in ensuring efficient use of resources, assessing the actual state of the sector, and developing economic growth forecasts.

The study also reveals that census results play a significant role in providing a scientific basis for agrarian policy, identifying "growth points" at the regional level, directing investments in a targeted manner, and ensuring food security. At the same time, the increasing demand for large volumes of reliable data in the process of implementing modern digital technologies further enhances the importance of the agricultural census.

However, the findings of the study also indicate that while an agricultural census is a necessary condition for ensuring agrarian economic growth, its effectiveness depends on the quality of data, as well as the level of their processing and integration into management decision-making. Therefore, to ensure the effective use of census results, it is essential to develop digital infrastructure, improve data analytics, and strengthen institutional mechanisms.

In conclusion, it can be emphasized that the agricultural census represents the initial and decisive link in the "data — analysis — decision — outcome" chain, and serves as a key prerequisite for achieving sustainable economic growth in the agrarian sector.

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